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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/009,693	12/10/2001	Hiroyuki Kimura	46342 /56776	1297

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EXAMINER	
MAYER, SUZANNE MARIE	
ART UNIT	**PAPER NUMBER**
1653	

DATE MAILED: 10/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/009,693	KIMURA ET AL.	
	Examiner	Art Unit	
	Suzanne M. Mayer, Ph.D.	1653	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) *4-11 and 14-19* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,12 and 13* is/are rejected.

7)☒ Claim(s) *12 and 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 December 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12-10-2001*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-3 and 12-13 in the reply filed on September 21, 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 4-11 and 14-19 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected inventive group, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on September 21, 2004.

Oath/Declaration

3. The examiner acknowledges that the objection to the oath/declaration as set forth in PTOL-326 of the previous office action was erroneous and subsequently the objection is withdrawn.

Specification

4. The abstract of the disclosure is objected to because the format of the abstract should consist of a single paragraph. Correction is required. See MPEP § 608.01(b).

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Novel GABA Transporter Protein and DNA thereof.

Drawings

4. The subject matter of this application admits of illustration by a drawing to facilitate understanding of the invention. Applicant is required to furnish a drawing under 37 CFR 1.81. No new matter may be introduced in the required drawing. The drawings were not filed separately from the specification. Furthermore, of the drawings that could be located within the specification, only Figure 1 out 2 was present.

Claim Objections

5. Claims 12 and 13 are objected to under 37 CFR 1.75(c) as being in improper form because these claims are multiple dependent claim upon both claims 3 and 1. See MPEP § 608.01(n). Omitting specific reference to claim 3 would likely overcome this objection.

Claim Rejections - 35 USC § 101

6. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-3 and 12-13 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The polypeptide as claimed, has an amino acid sequence duplicative of that of the protein designated as SEQ ID No: 1

or the cellular precursor thereof and possesses the biological and functional properties of the naturally occurring polypeptide of a purported novel GABA transporter protein and therefore does not constitute patentable subject matter absent recitation of "isolated and purified" in the preamble. See *American Wood v. Fiber Disintegrating Co.*, 90 U. S. 566 (1974); *American Fruit Growers v. Brogdex Co.*, 283 U. S. 1 (1931); *Funk Brothers Seed Co. v. Kalo Inoculant*, 33 U. S. 127 (1948); and *Diamond v. Chakrabarty*, 206 USPQ 193 (1980).

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1 and 2 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The last word claim 1 should be corrected to recite the word 'salt'.

Claim 2 is included in this rejection as it does not cure the defect.

9. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

10. Claims 1, 3, 12 and 13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claims contain subject matter which was not described in the specification in such a way as to enable one skilled in

the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 1 reads on polypeptides that possess an amino acid sequence that is 'substantially the same' as SEQ ID NO:1. Thus, the claims read on any portion of this protein's sequence in reference any sort of substitution, deletion or insertion of this protein. The scope of the instant claims is not commensurate with the enablement of the instant disclosure, because practice of the claimed invention would require undue experimentation by an artisan of ordinary skill in the art. For example, it is not known whether one of these substitutions, deletions, insertions etc. would have a severe deleterious effect to the activity of the protein. Thus for the instant claimed invention, it would require an undue burden of experimentation for a skilled artisan to determine exactly which proteins that had 'substantially the same amino acid sequence' as SEQ ID No: 1 would function as the wild-type protein.

The factors to be considered in determining whether undue experimentation is required are summarized In re Wands 858 F.2d 731, 8 USPQ2nd 1400 (Fed. Cir, 1988). The court in Wands states: "Enablement is not precluded by the necessity for some experimentation such as routine screening. However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue,' not 'experimentation.' " (Wands, 8 USPQ2d 1404). Clearly, enablement of a claimed invention cannot be predicated on the basis of quantity of experimentation required to make or use the invention. "Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many

factual considerations." (Wands, 8 USPQ2d 1404). The factors to be considered in determining whether undue experimentation is required include: (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

The factors to be considered in determining whether undue experimentation is In the instant case the quantity of experimentation would be large since there are myriad substitutions, deletions or insertions to choose from. The amount of guidance in the specification is zero with regard to which amino acids in SEQ ID No: 1 are essential for activity. No working examples are present of substantially similar proteins. The nature of the invention is such that many different proteins that are 'substantially similar' to SEQ ID No: 1 may or may not have biological activity and there may be no way to test for any particular activity. The state of the prior art is that even protein that are 99.99% similar to the wild-type protein are not necessarily fully active. The relative level of skill in this art is very high. The predictability as to what substantially similar protein will have which activity is zero. For example, it has been shown that severe harmful effects result from a single amino acid substitution in the component 1 protein of the enzyme nitrogenase and that this single amino acid substitution can be lethal to the enzymes activity. The nitrogenase component 1 protein is a 240 kDa metallo-protein with 1994 amino acids. A single conservative substitution at the active site that eliminates a single hydrogen bond renders this enzyme incapable of dinitrogen reduction, which is its main

enzymatic function (see Sørlie et al., p.1541 first paragraph). Other substitutions 15 Å away from the active site, this one a double substitution of phenylalanines for alanines on the surface of the protein, also are 'lethal' to this enzyme's function (see Christiansen et al., p.198 Table 1 and p.200 Table 2). Therefore, even a nitrogenase enzyme with 'substantially the same amino acid sequence' as compared to the wild-type enzyme (99.89% similar to be exact) has been shown to be significant.

When the factors are considered in their entirety, the Wands analysis dictates a finding of undue experimentation and thus, the claim is not enabled.

11. Claims 3, 12 and 13 are drawn to partial peptides of SEQ ID No: 1. The claims do not require that the partial peptides possess any particular biological activity, nor any particular conserved structure, defining characteristics or other disclosed distinguishing feature. Thus, the claims are drawn to an undefined genus of amino acids that may or may not possess any particular biological function whatsoever and it would require undue burden upon a skilled artisan to ascertain which partial peptides possessed biological GABA transporter activity that functioned the same as the full length protein.

The factors to be considered in determining whether undue experimentation is required are described above. In the instant case the quantity of experimentation would be large since there are myriad biological activities to choose from. The amount of guidance in the specification is zero with regard to fragments having some activity other than the enzymatic activity of the entire protein. No working examples are present of defined fragments. The nature of the invention is such that many fragments of many different lengths may or may not have biological activity and there may be no way to

test for any particular activity. The state of the prior art is that many biological activities exist that might be possessed by various peptides. The relative level of skill in this art is very high. The predictability as to what fragment will have which activity is zero. The claim reads on fragments from a dipeptide up to one amino acid less than the full-length protein.

When the factors are considered in their entirety, the Wands analysis dictates a finding of undue experimentation and thus, the claim is not enabled.

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claim 3 is rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al. Smith et al. teach a sequence (SEQ ID No: 8) that is 246 amino acids long, possesses GABA transporter activity (see p. 27, lines 9-14) and corresponds to amino acids 357-602 of SEQ ID No: 1 of the instant application.

Conclusion

13. No claim is allowed.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suzanne M. Mayer, Ph.D. whose telephone number is 571-272-2924. The examiner can normally be reached Monday to Friday from 8.30am to 5.00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon Weber can be reached on 571-272-0925. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SMM
23 September, 2004

ROBERT A. WAX
PRIMARY EXAMINER